

PROGRESS IN RARE PLANT CONSERVATION IN MAINE

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ABSTRACT

The last decade has brought significant advances in knowledge and conservation of rare plant species in Maine. The status of rare species in the state is reflected in the Official List of Maine's Plants that are Endangered or Threatened, recently compiled by the Maine State Planning Office. Systematic inventories by the Maine Critical Areas Program and The Nature Conservancy's Natural Heritage Program have uncovered numerous new populations of species of national concern, and stations for over 50 species for which there were no known extant stations eight years ago. However, 91 species are still considered possibly extirpated in Maine. While 34% of these are northern species, 57% are southern species reaching the northern limits of their ranges in southwestern Maine. It is not known whether this disproportion reflects uneven inventory effort or a greater number of local extinctions.

In the last eight years, private conservation organizations have acquired ten sites totalling 2000 acres to protect 45 species of plants. The voluntary cooperation of numerous state agencies, as well as over 225 private landowners, has been enlisted in protecting 168 rare plant stations placed on the Register of Critical Areas. Maine still lacks legislation specifically protecting rare plants. Thus, the principal hopes for further progress in rare plant conservation in Maine lie in continued public education, landowner cooperation, and especially acquisition of critical habitat.

Key Words: Maine, endangered, conservation, rare plants

The last decade has brought significant advances in our knowledge of rare plant species in Maine and important strides in their conservation. The current understanding of the status of rare species in the state is reflected in the Official List of Maine's Plants that are Endangered or Threatened which was recently compiled by the Maine State Planning Office (Dibble et al., in prep.). This list includes 84 Endangered and 74 Threatened taxa. While this list is a direct descendant of previous efforts, including that of the NEBC (Eastman, 1978), it is important as the first result of 1986 state legislation authorizing the creation and maintenance of an official list of rare plant species and thus represents a notable advance in public and governmental awareness of rare plant conservation needs.

Effective endangered species conservation depends on three basic components: identification, education, and protection. The obvious and essential first step is knowing what you have—what species are rare and where they occur. The initiation of a Natural Heritage Program by the Maine Chapter of The Nature Conservancy, increased state funding for the addition of a botanist to the staff of Maine's Critical Areas Program, and the signing of a Limited Cooperative Agreement between the State Planning Office and the USF&WS Office of Endangered Species have contributed to a substantial increase in the resources devoted to the inventory of rare plants in the state.

Recent inventory effort has focused on several centers of plant rarity in Maine: coastal Washington and Hancock Counties (Olday et al., 1983), St. John and Aroostook Rivers (Gawler, 1983), estuaries of the Kennebec and Penobscot Rivers, northern peatlands, especially ribbed fens and other circum-neutral wetland habitats (Davis et al., 1983; Sorenson, 1986; Widoff, 1988) and alpine areas of Mt. Katahdin (Hudson, 1985) and the Mahoosucs (Burke, 1982; Hudson, 1986). Inventories in York and Cumberland Counties have targeted likely habitat for selected species such as *Isotria medeoloides*, *Carex polymorpha*, and *Iris prismatica*.

While current state lists (Dibble et al., in prep.) include almost all the species on previous lists by Eastman (1978) and Gawler (Critical Areas Program, 1981), new knowledge of their distribution and abundance has changed the recognized status of many species. Happily, the news is mostly good; often (with some notable exceptions), the more we look the more we find. Inventories sponsored by the Maine Critical Areas Program and the Natural Heritage Program, in cooperation with the USF&WS, have uncovered new populations for species of national concern such as *Isotria medeoloides*, *Pedicularis furbishiae*, *Carex polymorpha*, *Carex oronensis*, *Cardamine longii*, and *Eriocaulon parkeri* (Table 1). At least six species not previously known to occur in the state have been discovered in the past decade: *Minuartia rubella*, *Dentaria laciniata*, *Drosera anglica*, *Carya cordiformis*, *Sporobolus asper*, and *Polemonium vanbruntiae*. Stations have been established for over 50 species for which there were no known stations eight years ago. Many additional stations have been located by volunteers. As many as 36 species formerly considered rare or even threatened have now been placed on a general watch list (Vickery et al., 1985).

Table 1. Current status in Maine of taxa listed, proposed, or under review as Threatened or Endangered by the U.S. Fish and Wildlife Service.

Species	Status in 1980 ^a	Status in 1985 ^b	No. of Known Sta. 1981 ^c	No. of Known Sta. 1987 ^d
<i>Pedicularis furbishiae</i>	Listed End.	Listed End.	8	11
<i>Isotria medeoloides</i>	Prop. End.	Listed End.	2	12
<i>Paronychia argyrocoma</i> v. <i>albimontana</i>	Prop. End.	Withdrawn	2	5
<i>Carex oronensis</i>	Under review	Under review	1	23
<i>Scirpus longii</i>	Under review	Under review	0	0
<i>Listera auriculata</i>	Under review	Under review	1	7
<i>Plantanthera leucophaea</i>	Under review	Prop. Threat.	1	1
<i>Cardamine longii</i>	Under review	Under review	2	8
<i>Oxytropis campestris</i> v. <i>johannensis</i>	Under review	Under review	4	8
<i>Viola novae-angliae</i>	Under review	Under review	0	9
<i>Mimulus ringens</i> v. <i>colpophilus</i>	Under review	Under review	0	4
<i>Valeriana sitchensis</i> ssp. <i>uliginosa</i>	Under review	Withdrawn	3	9
<i>Prenanthes boottii</i>	Under review	Under review	2	3
<i>Eriocaulon parkeri</i>	—	Under review	3	21
<i>Carex polymorpha</i>	—	Under review	0	3

^a U.S. Fish and Wildlife Service, 1980.

^b U.S. Fish and Wildlife Service, 1985.

^c Critical Areas Program, 1981.

^d Dibble et al., in prep.

By comparison, documented losses of rare species in recent years have been apparently few, although timber harvesting has destroyed critical habitat and decimated populations at several known rare plant stations. However, 91 species are still considered possibly extirpated in Maine because no stations for them have been documented in the last 20 years. Interestingly, while 34% of these possibly extirpated taxa are northern species reaching their southern range limits in Maine, 57% are southern species, typically only known from one or two herbarium records over 80 years old from York or Cumberland County. There have been re-discoveries of 21 out of 41 historic northern species as opposed to only 16 out of 62 southern plants for which there were no known extant stations in 1981 (Critical Areas Program, 1981). The high proportion of southern species not relocated may reflect

uneven inventory effort. Alternatively, this may reflect a greater number of local extinctions due to natural causes such as increasingly severe winters, or habitat destruction in this rapidly developing part of the state.

Many more rare plant stations are destroyed through ignorance than intention. The second key step in conservation is education—getting the information to the public, the landowners, and land managers. Maine's Critical Areas Program has contributed by publishing and disseminating planning reports and botanical fact sheets on 146 species, an educational brochure on *Pedicularis furbishiae*, an addendum to *Rare Vascular Plants of Maine*, and a compilation of distribution maps for all rare plant species. The Program has cosponsored two statewide endangered species conferences to encourage public awareness and participation in rare plant conservation. Since 1974, the Critical Areas Program has placed 168 botanical sites on the Register of Critical Areas, Maine's official list of special areas worthy of conservation. A key component of the program is notification of landowners of rare species on their land, providing them with information on the species' biology and habitat needs, and soliciting their voluntary cooperation in the protection of the plants. To date, over 225 landowners of rare plant sites have been contacted. The booklet *The Landowner's Options* (Milne, 1985), explaining the variety of land conservation strategies available in Maine, is provided to each landowner. The 85% response rate to the biennial status update mail survey is one indication of the success of this landowner notification effort.

The third and most critical component of conservation is actual protection of the rare species and their habitats. One potential tool for providing such protection is through legislation. Maine still lacks legislation specifically protecting rare plant species from exploitation or habitat destruction. The Natural Resources Protection Act provides incidental protection to some Endangered and Threatened plants by regulating activities in coastal wetlands, inland freshwater wetlands, Great Ponds, streams, and areas above 2700 feet in altitude. However, freshwater wetlands smaller than ten acres are not included and activities such as peat mining, normal forestry, and agriculture are exempted from review. State guidelines included in the Mandatory Shoreland Zoning Act name endangered plants as one of the natural resources for towns to consider in establishing Resource Protection Zones. However,

municipal officials responsible for issuing permits or variances are not systematically informed of the presence or location of such species in their jurisdiction. Other laws such as the Site Location of Development Act require protection of "unique resources," but there are not clearly defined and do not explicitly refer to endangered plant species.

The 1983 Maine Rivers Bill, which prohibits new dam construction and limits shoreline development on 1100 miles of rivers with outstanding values, provides some protection to the habitat for 15 Endangered and Threatened species (Maine River Study, 1982). However, key sections of the St. John and Penobscot Rivers where such species as *Pedicularis furbishiae* and *Carex oronensis* occur are not protected under this act.

In the absence of effective, comprehensive state regulation, the primary tool for rare plant protection must be habitat acquisition and management. In the last eight years, private conservation organizations have secured legal interests in 12 sites totalling over 2000 acres that provide habitat for 27 species of rare plants. The habitats included in these projects range from a northern fen at Woodland Bog, to Rocky Island in the St. John River, to a portion of a sandplain grassland at the Kennebunk Plains, to a *Chamaecyparis* stand on a domed peatland at Saco Heath. Eight preserves of The Nature Conservancy protect habitat for four Endangered species and 14 Threatened species. Five additional sites with Endangered or Threatened species are owned by the New England Wildflower Society and local land trusts.

State and federal agencies own a number of rare plant sites in Maine, most notably Mt. Katahdin and associated areas in Baxter State Park where there are 45 Endangered, Threatened, and Special Concern plant species. Land management plans recently developed by the Bureau of Public Lands for the Mahoosucs, Deboullie Lake area, and Allagash Lot on the St. John River and the Department of Inland Fisheries and Wildlife for the Vern Walker Wildlife Management Area specifically attempt to accommodate the needs of eight Endangered and Threatened plant species. A number of Endangered and Threatened species occur on federal lands such as Acadia National Park and the Rachel Carson Petit Manan Wildlife Refuges.

Of 92 Critical Areas with Endangered or Threatened species, 11 are at least partially owned by private conservation organizations and 18 are owned entirely by state, federal, or town gov-

ernments. At least one station for 36 Endangered (42% of total in state) and 34 Threatened species (46%) is currently owned by a federal, state, or private conservation agency.

Passage in 1987 of a \$35 million bond issue for acquisition of natural land greatly enhances prospects for rare plant conservation in Maine, both because it includes the presence of endangered species habitat as one of the potential criteria for site selection and because it requires that any land acquired with these funds be inventoried for rare species and managed so as to perpetuate them.

Where are the Endangered and Threatened species still in need of protection? Fortunately, two of Maine's major concentrations of rare species are already protected: the Mt. Katahdin area and Crystal Bog. However, the St. John River with Furbish's Lousewort and four other Endangered and six Threatened species is not yet secure, nor is Twin Peaks in northern Oxford County, where nine Endangered or Threatened species occur. Such sites represent especially high priorities and clear conservation challenges in the coming years.

The remaining unprotected species are not evenly scattered across the state. Perhaps not surprisingly, nearly half occur in specific limited habitats unsuitable for development in any case, such as cliffs, pond or river shores, or saltmarshes. These species could be protected if natural resource protection statutes already in place were substantially strengthened and rigorously enforced. Of the remaining upland plants of woods, fields, and roadsides—especially vulnerable to habitat destruction through logging or development—more than half occur in forested areas of the southernmost counties, which are also experiencing the most rapid development. This threat, combined with the high proportion of historic and unrelocated species in this area, suggests that York, Cumberland, and southern Oxford Counties should receive high priority for both inventory and protection activities in the immediate future.

Important progress has been made in rare plant conservation in Maine. With increased inventory effort, many sites for rare plants have been discovered or relocated; landowners of the majority of these sites in Maine have been notified. The public in general, and state and town regulatory and planning officials especially, is increasingly aware and concerned for the needs of rare species. Nearly half of the species listed as Endangered or

Threatened in Maine occur on land owned by a government or private conservation agency. The creation of an Official List of Endangered and Threatened Species has focused priorities for additional land conservation and management efforts in both the public and private sectors.

On the other hand there are many challenges remaining. There are over 90 species with fewer than five known stations in the state for which there is no protection by conservation ownership or state regulation. The additional 91 historic species for which no extant stations have been found should signal the urgency of the conservation task, as Maine is now experiencing the kind of development already long underway in southern New England. We will undoubtedly lose more species soon unless prompt action is taken. We need to continue to inventory, educate, strengthen our natural resource and endangered species laws, and, especially, bring more critical habitat under protective stewardship.

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